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Paliobeis

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(54) **PIVOTING HANDLE FOR A SURFACE CLEANING DEVICE**

(71) Applicant: **Techtronic Floor Care Technology Limited**, Road Town, Tortola (VG)
(72) Inventor: **Steven J. Paliobeis**, Mentor, OH (US)
(73) Assignee: **Techtronic Floor Care Technology Limited**, Tortola (VG)

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(22) Filed: **Sep. 4, 2015**

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A47L 9/32 (2006.01)

(52) **U.S. Cl.**
CPC ***A47L 9/325*** (2013.01)

(58) **Field of Classification Search**
CPC A47L 9/325; A47L 9/32; A47L 9/10; A47L 9/02; A47L 9/327; A47L 9/009; A47L 5/28
See application file for complete search history.

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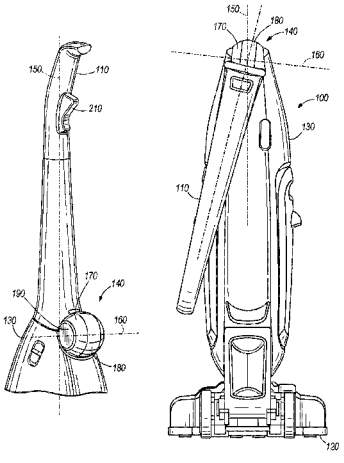
Primary Examiner — Dung Van Nguyen
(74) *Attorney, Agent, or Firm* — Michael Best & Friedrich LLP

(57) **ABSTRACT**

A surface cleaning device generally includes a nozzle, a cleaner housing connected to the nozzle, and a handle coupled to the cleaner housing at a pivot joint. The cleaner housing defines a longitudinal axis. The pivot joint is configured to rotatably store the handle at a position offset from the longitudinal axis.

20 Claims, 8 Drawing Sheets



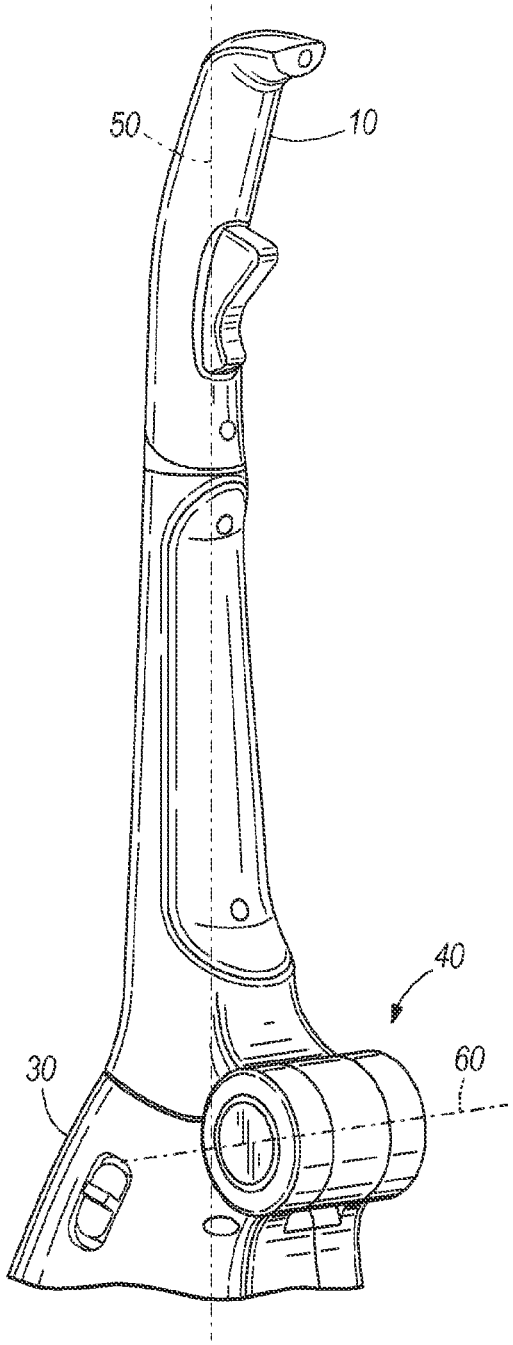


FIG. 1
PRIOR ART

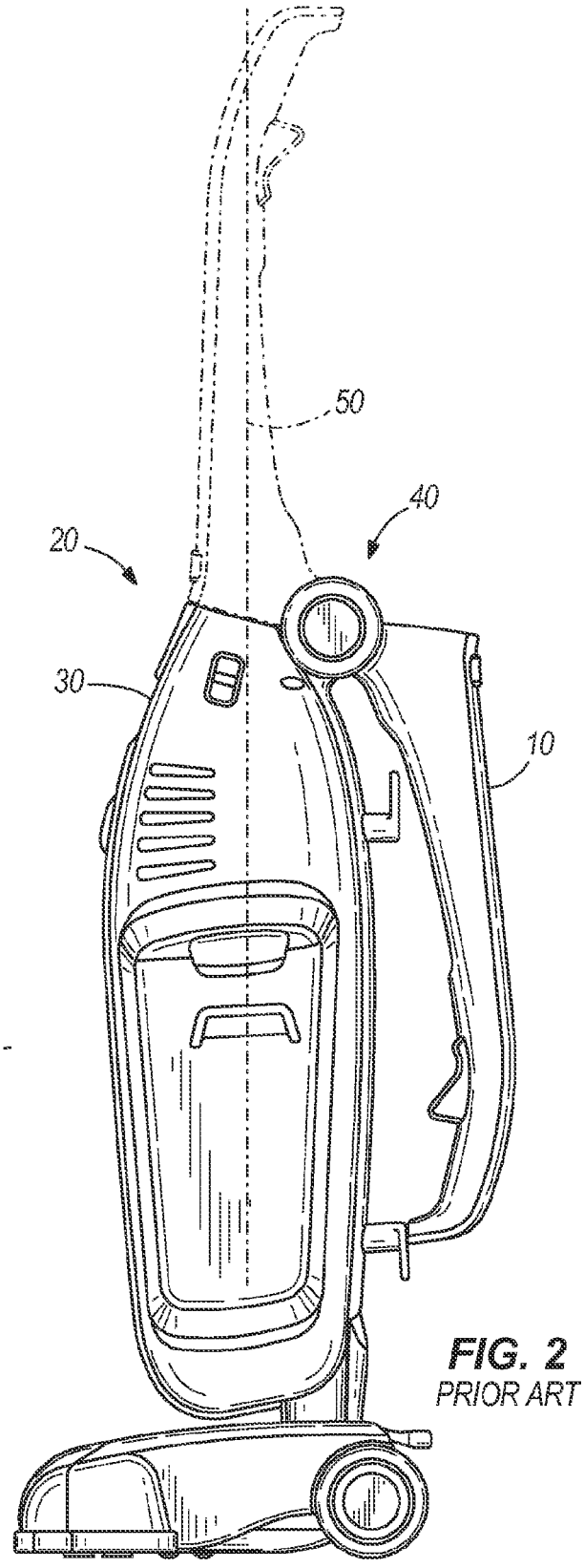


FIG. 2
PRIOR ART

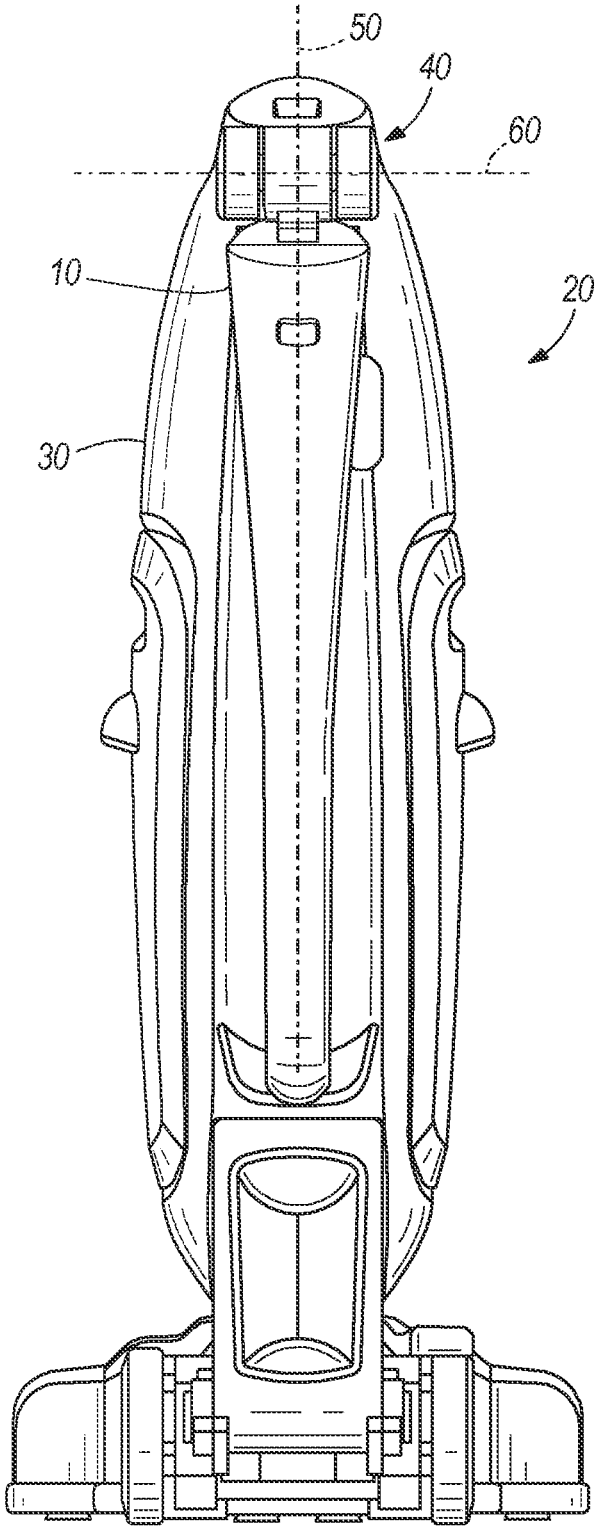


FIG. 3
PRIOR ART

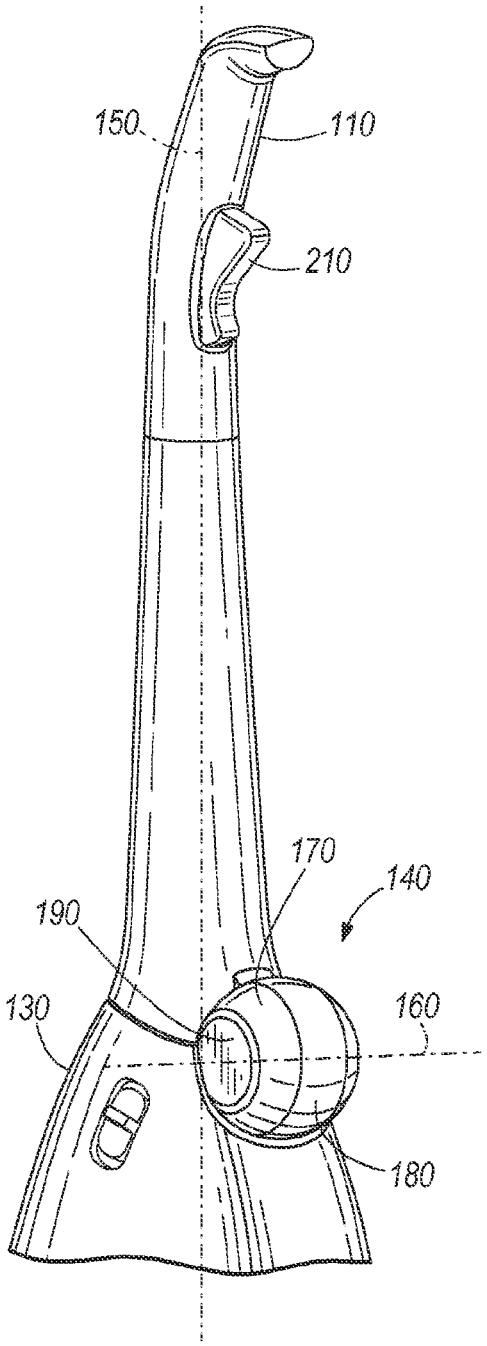

150
110
210
170
140
190
130
160
180

FIG. 4

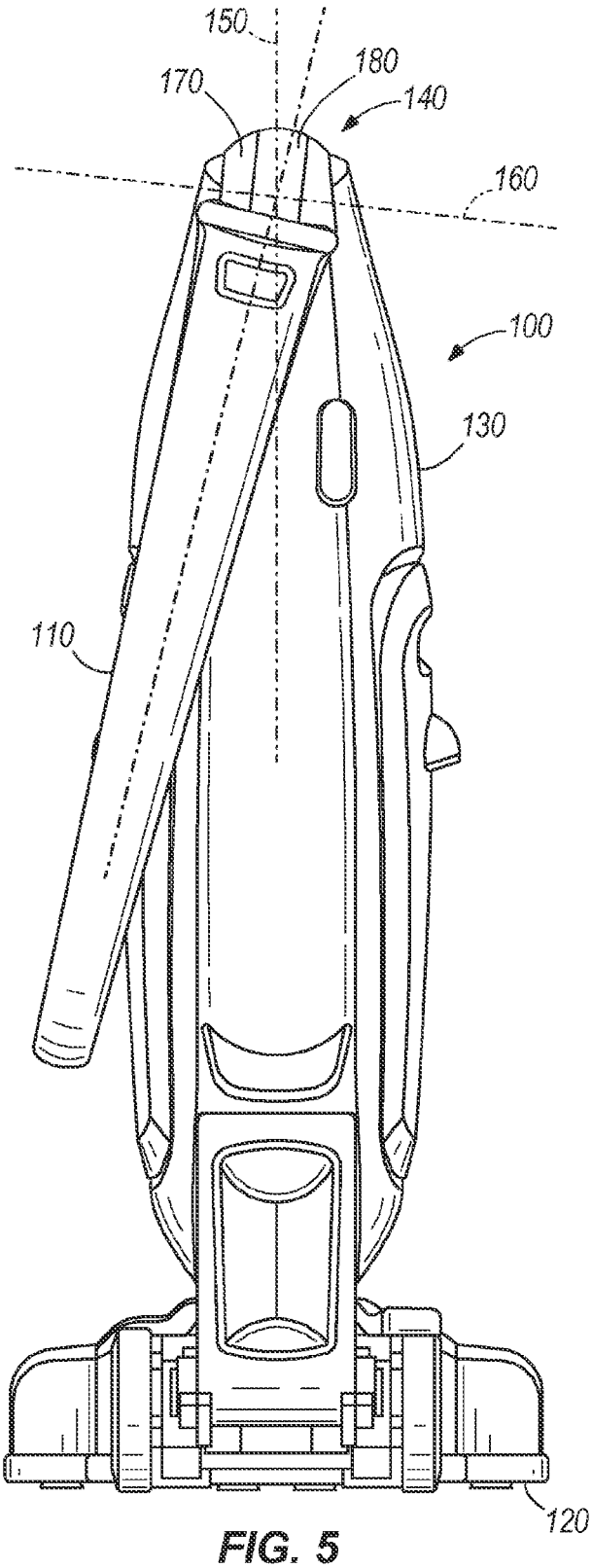

150
180
170
140
160
100
130
110
120

FIG. 5

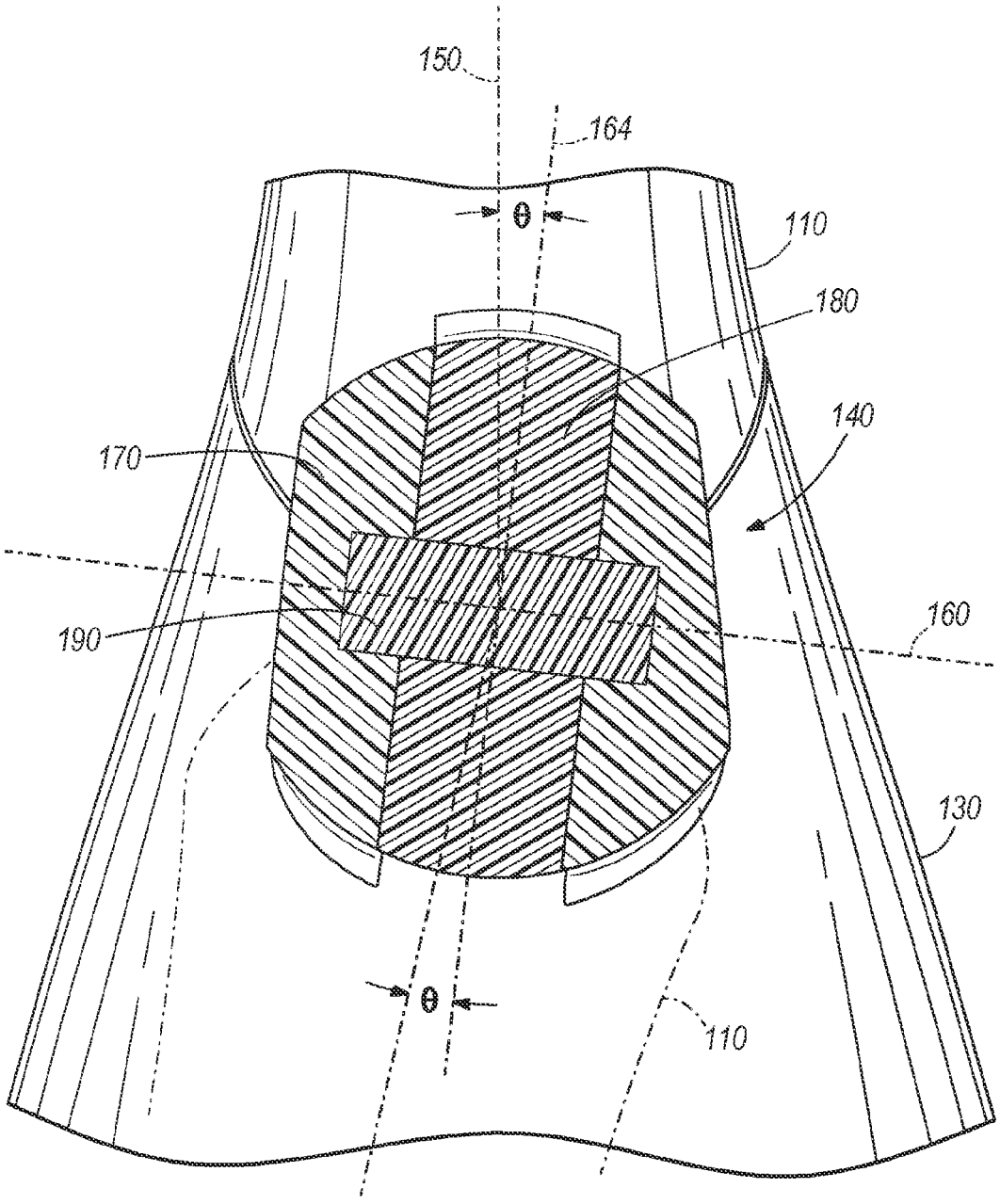


FIG. 6

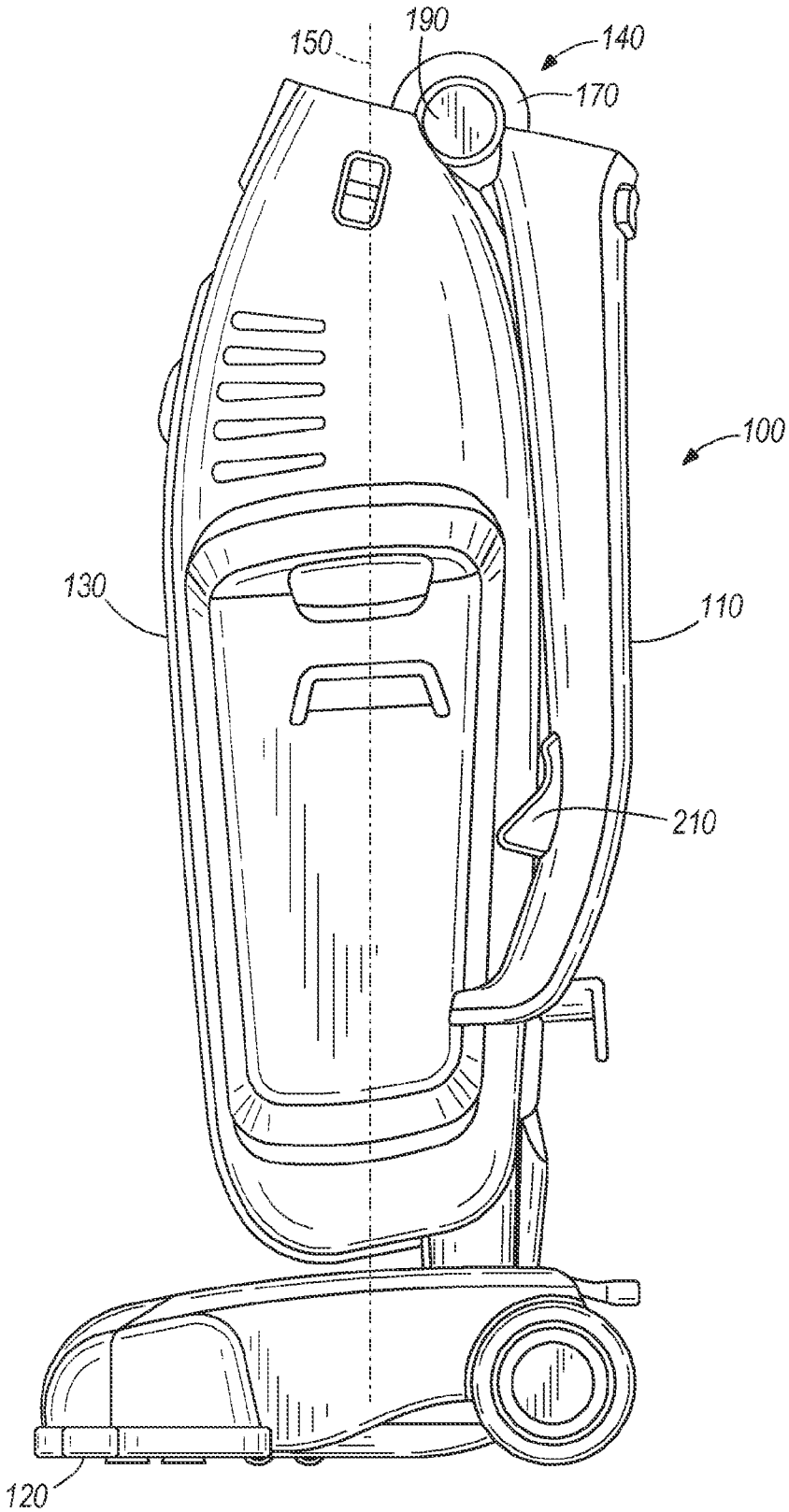


FIG. 7

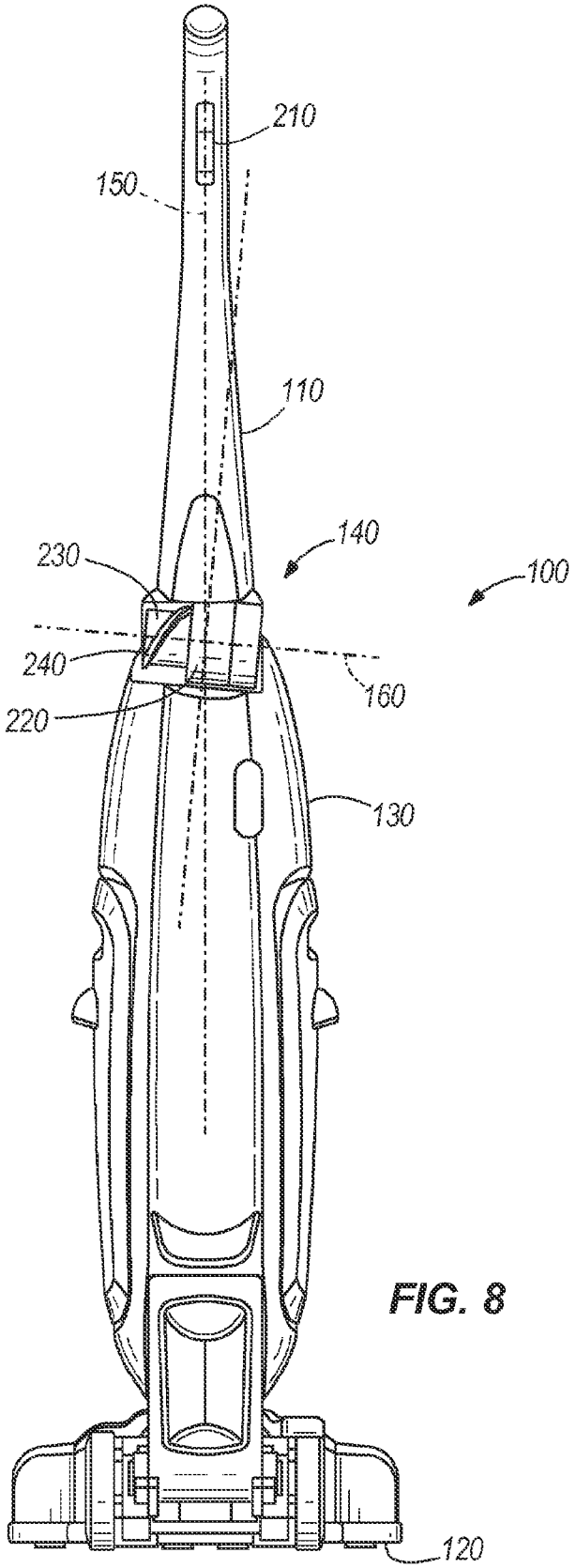


FIG. 8

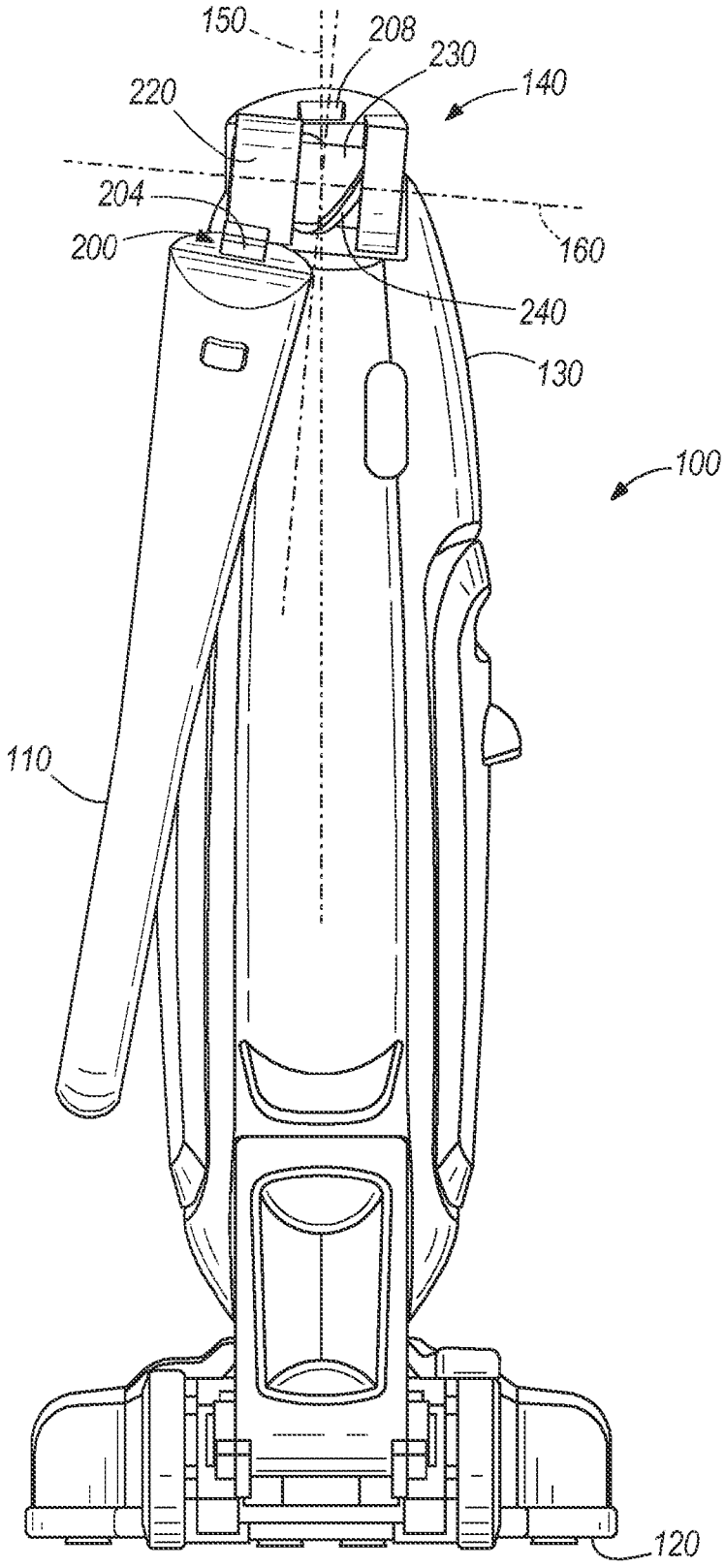


FIG. 9

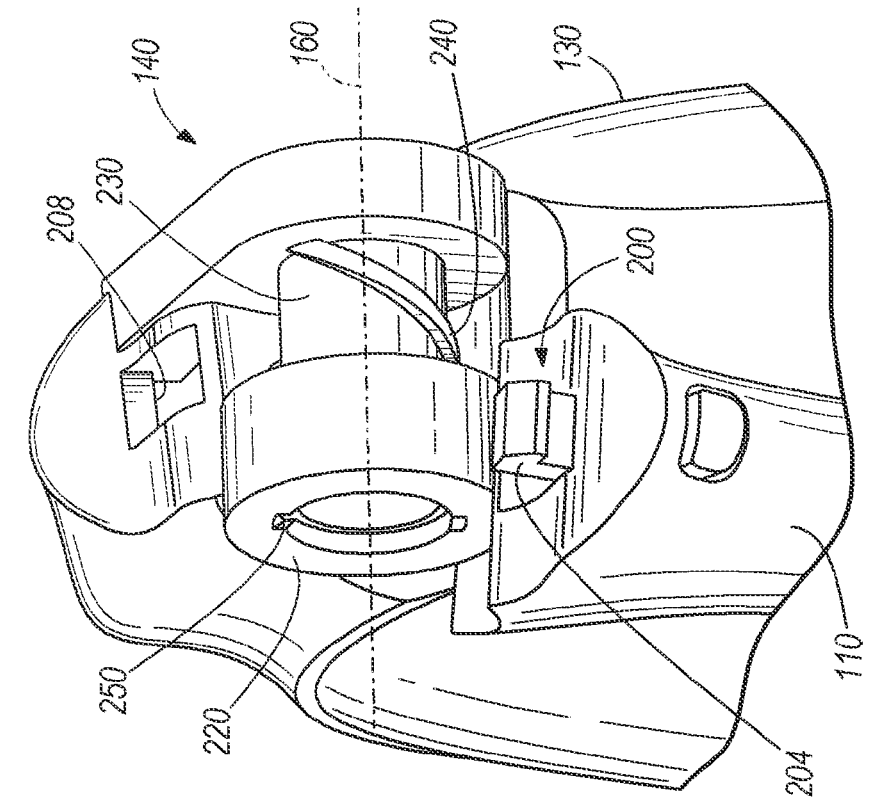

140
160
240
130
208
230
200
250
220
204
110

FIG. 11

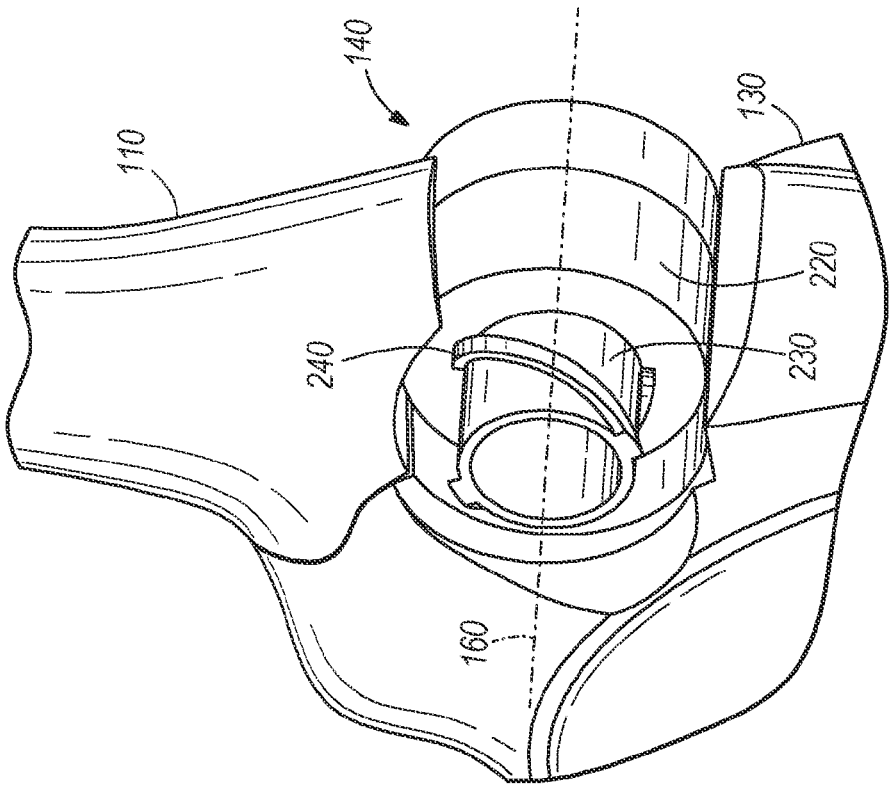

140
110
130
220
240
230
160

FIG. 10

PIVOTING HANDLE FOR A SURFACE CLEANING DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of and claims priority to U.S. Pat. No. 9,125,538, filed Jul. 27, 2012, the entire contents of which are herein incorporated by reference.

BACKGROUND

Vacuum cleaners typically include a suction nozzle, a cleaner housing connected to the suction nozzle, a suction generator in the cleaner housing, and a dirt collection vessel in the cleaner housing. In an upright-type vacuum cleaner, an elongate handle is coupled to the cleaner housing. The handle may be pivotable, so that the handle extends vertically for operating the vacuum and is rotated downwardly for storing or stowing.

SUMMARY

In one embodiment, a surface cleaning device generally includes a nozzle, a cleaner housing connected to the nozzle, and a handle coupled to the cleaner housing at a pivot joint. The cleaner housing defines a longitudinal axis. The pivot joint is configured to rotatably store the handle at a position offset from the longitudinal axis.

In another embodiment, a surface cleaning device generally includes a nozzle, a cleaner housing connected to the nozzle, and a handle coupled to the cleaner housing at a pivot joint. The cleaner housing defines a longitudinal axis. The pivot joint is configured to rotate the handle about a pivot axis that is non-perpendicular to the longitudinal axis.

In still another embodiment, a surface cleaning device generally includes a nozzle, a cleaner housing connected to the nozzle, and a handle coupled to the cleaner housing at a pivot joint. The cleaner housing defines a longitudinal axis. The pivot joint is configured to rotate the handle about a pivot axis, and to translate the handle in a direction along the pivot axis.

Other aspects of the invention will become apparent by consideration of the detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an enlarged partial perspective view of a conventional handle for a vacuum cleaner.

FIG. **2** is a perspective view of the conventional handle of FIG. **1** rotated to a storage position.

FIG. **3** is a rear end view of a vacuum cleaner with the conventional handle of FIG. **1**.

FIG. **4** is a perspective view illustrating a vacuum cleaner with a handle according to one embodiment of the invention.

FIG. **5** is an end view of the vacuum cleaner of FIG. **4** illustrating the handle rotated to a storage position.

FIG. **6** is a cross-sectional view of the vacuum cleaner of FIG. **4**, illustrating a pivot joint.

FIG. **7** is a side view of the vacuum cleaner of FIG. **4**.

FIG. **8** is a rear end view of a vacuum cleaner with a handle according to another embodiment of the invention.

FIG. **9** is a rear end view of the vacuum cleaner of FIG. **8** illustrating the handle rotated to a storage position.

FIG. **10** is an enlarged partial perspective view of the handle of FIG. **8**.

FIG. **11** is an enlarged partial perspective view of the handle of FIG. **8**.

It should be understood that the invention is not limited in its application to the details of construction and the arrangements of the components set forth in the following description or illustrated in the above-described drawings. The invention is capable of other embodiments and of being practiced or being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting.

DETAILED DESCRIPTION

FIG. **1** is an enlarged partial perspective view of a conventional handle **10** for a cleaning device or upright-type vacuum cleaner **20**. The handle **10** is coupled to the cleaner housing **30** at a pivot joint **40**. A "handle" as used herein includes definitions that are generally known in the mechanical art, and may include a handgrip. For example, the handle **10** includes any structure that extends generally upwardly from the cleaner housing **30** that transfers forces caused by the operator to the cleaning device **20** to move the cleaning device **20** over a surface to be cleaned. Referring also to FIGS. **2** and **3**, the cleaner housing **30** defines a centerline **50**. The pivot joint **40** is configured to rotate the handle **10** about a pivot axis **60** that is perpendicular to the centerline **50**. In both the operating (see FIG. **1**) and the storage (see FIGS. **2** and **3**) positions, the handle **10** extends substantially parallel to the centerline **50**. For operating the vacuum cleaner **20**, the handle **10** is rotated upwardly about the pivot axis **60** so that the handle **10** extends upwardly and away from the cleaner housing **30**. As used herein, the terms "top," "bottom," "front," "rear," "side," "upwardly," "downwardly," and other directional terms are not intended to require any particular orientation, but are instead used for purposes of description only. For storing or stowing, the handle **10** is rotated downwardly. In this configuration, when viewed from a direction perpendicular to the centerline **50** (see FIG. **2**), the handle **10** protrudes from the outer profile of the cleaner housing **30**, thereby requiring additional space for storing the vacuum cleaner **20**. Thus, there has developed a need for a mechanism that enables storing the vacuum cleaner in a compact footprint.

FIG. **4** illustrates a vacuum cleaner **100** with an elongate handle **110**. Referring also to FIG. **5**, the vacuum cleaner **100** includes a suction nozzle **120**, a cleaner housing or body **130** connected to the suction nozzle **120**, a suction generator (not shown) in the cleaner housing **130**, and a dirt collection vessel (not shown) in the cleaner housing **130**. The handle **110** is coupled to the cleaner housing **130** at a pivot or hinge joint **140**. The cleaner housing **130** defines a central longitudinal axis or centerline **150**. The pivot joint **140** is configured to rotate the handle **110** about a pivot axis **160** that is non-perpendicular to the longitudinal axis **150**. Referring also to FIG. **6**, the handle **110** extends non-perpendicular to the pivot axis **160**. That is, the handle **110** is offset from an orientation **164** perpendicular to the pivot axis **160** at an acute angle θ. As such, when the handle **110** is folded downwardly, the handle **110** is rotated substantially conically about the pivot axis **160**. In some embodiments, the pivot axis **160** is offset from an orientation perpendicular to the longitudinal axis **150** by approximately 5° to approximately 7°. In other embodiments, however, the pivot axis **160** may extend at other angles that are non-perpendicular to the longitudinal axis **150**.

Referring also to FIG. **7**, when the handle **110** is rotated or folded downwardly for storing or shipping, the handle **110** moves to a position adjacent to and offset from the cleaner housing **130** of the vacuum cleaner **100**. In contrast to prior art configurations, the handle **110** does not substantially protrude from the outer profile or contour of the cleaner housing **130** when the handle **110** is rotated downwardly. As such, the vacuum cleaner **100** can be shipped or stored with the handle **110** in the folded position in a compact package without substantially increasing the footprint of the product compared to prior art configurations.

In the illustrated embodiment, the pivot joint **140** includes a female member **170** coupled to the cleaner housing **130** and a male member **180** coupled to the handle **110**. In other embodiments, however, the female member **170** can be coupled to the handle **110** and the male member **180** can be coupled to the cleaner housing **130**. The male member **180** is positioned proximate the female member **170**, and a pin **190** is insertable through the female and male members **170**, **180** to couple the cleaner housing **130** and the handle **110** together. The female and male members **170**, **180** are so dimensioned as to give a smooth substantially bulbous appearance when the pin **190** is inserted through the female and male members **170**, **180**.

Although in the illustrated embodiment only a single male member **180** on the handle **110** and only a single female member **170** on the cleaner housing **130** are shown, in further embodiments, the handle **110** may include one or more male members **180**, one or more female members **170**, or a combination thereof. Similarly, the cleaner housing **130** may also include one or more female members **170**, one or more male members **180**, or a combination thereof. The pivot joint **140** thus suitably includes one or more female and male members **170**, **180**. Moreover, although FIGS. **4-6** illustrate the female and male members **170**, **180** as integrally formed with the cleaner housing **130** and handle **110**, respectively, in other embodiments the female and male members **170**, **180** may be separately formed and attached to a respective one of the cleaner housing **130** and handle **110** via glue or fasteners.

In some embodiments, the vacuum cleaner **100** includes a locking unit **200**, which includes a detent **204** and a corresponding catch mechanism **208** (not shown in FIGS. **4-7**; see, e.g., FIG. **11**) between the cleaner housing **130** and the handle **110**, and a release member **210** connected to the detent **204**. The locking unit **200** is configured to releasably lock the handle **110** solely in a position substantially parallel to the longitudinal axis **150**, i.e., the operating position. The release member **210** may be spring-loaded or biased by any other suitable mechanisms. The detent is selectively movable between a locked position where the detent **204** contacts the corresponding catch mechanism **208**, and an unlocked position where the detent **204** is released out of the locking position. When the user rotates the handle **110** upwardly from the storage position toward the operating position, the detent **204** contacts the catch mechanisms **208** and locks the handle **110** so that the handle **110** fixedly extends upwardly and away from the cleaner housing **130**. When the user depresses the release member **210** against the bias toward the handle **110**, the detent **204** is released out of the locking position, thereby enabling the handle **110** to rotate or fold downwardly toward the storage position.

The surface cleaning device **100** is a vacuum cleaner adapted to clean a variety of surfaces, such as carpets, hardwood floors, tiles, or the like. More specifically, the illustrated surface cleaning device **100** is an upright wet vacuum cleaner capable of drawing in air and dirt such as liquid and debris. In alternative embodiments, the surface cleaning device **100** may not be a wet vacuum cleaner. Rather, the surface cleaning device **100** may be a dry vacuum cleaner capable of drawing in air and dirt such as dry debris. Alternatively, the surface cleaning device **100** may be an extractor capable of both dispensing liquid and drawing in air and dirt such as liquid and debris. In yet other embodiments, the surface cleaning device **100** may be a steam cleaner that dispenses liquid or steam but does not include a suction source. In still other embodiments, the surface cleaning device **100** may be a stick vacuum that does not include the brush rolls of other traditional upright cleaners. In additional embodiments, surface cleaning device **100** may be a sweeper that includes a handle and a pivoting base that supports a wet or dry cloth that is positioned below the base. These sweepers do not dispense liquid and do not include a suction source.

FIGS. **8-11** illustrate the vacuum cleaner **100** including a pivot joint **140** according to another embodiment of the invention. Like parts are identified using like reference numerals. The pivot joint **140** in this embodiment is configured to rotate the handle **110** about the pivot axis **160**, and also to translate the handle **110** along the pivot axis **160**. In the illustrated embodiment, the pivot axis **160** is non-perpendicular to the longitudinal axis **150** so as to store or stow the handle **110** at an orientation offset from the longitudinal axis **150**. In other embodiments, however, the pivot axis **160** can be perpendicular to the longitudinal axis **150**. As such, the handle **110** can be stored or stowed at a position that is linearly, but not angularly, offset from the longitudinal axis **150**.

The pivot joint **140** includes a female member **220** coupled to the handle **110** and a male member **230** coupled to the cleaner housing **130**. The male member **230** is received into the female member **220** to couple the cleaner housing **130** and the handle **110** together. In the illustrated embodiment, the male member **230** includes a projection or thread **240**, and the female member **220** includes a groove **250** that corresponds to the projection **240**. In some embodiments, the projection **240** extends helically about the pivot axis **160**. The projection **240** and the groove cooperate together to translate the handle **110** along the pivot axis **160**. That is, when viewed from the rear in a direction substantially perpendicular to the longitudinal axis **150**, the handle **110** is translated generally from right to left along the pivot axis **160** as the handle **110** is rotated from the operating position (see FIGS. **8** and **10**) to the storage position (see FIGS. **9** and **11**). In other embodiments, the male member **230** may include the groove **250** and the female member **220** may include the projection **240**. In still other embodiments, the female member **220** may be coupled to the cleaner housing **130** and the male member **230** may be coupled to the handle **110**.

Although the invention has been described in detail with reference to certain preferred embodiments, variations and modifications exist within the scope and spirit of one or more independent aspects of the invention as described.

The invention claimed is:

1. A surface cleaning device comprising:

a base including a suction nozzle, the base defines a front edge positioned adjacent the suction nozzle, a back edge opposite the front edge, a first side surface extending between the front edge and the back edge;

a cleaner housing pivotally coupled to the base, the cleaner housing defining longitudinal axis; and

a handle movably coupled to the cleaner housing such that the handle is movable relative to the cleaner housing from an operating position downwardly to a storage position,

wherein as the handle moves from the operating position to the storage position, the handle moves away from the longitudinal axis and toward the first side surface.

2. The surface cleaning device of claim **1**, wherein the handle pivots relative to the cleaner housing about a pivot axis.

3. The surface cleaning device of claim **2**, wherein the pivot axis is non-perpendicular to the longitudinal axis.

4. The surface cleaning device of claim **2**, wherein the handle linearly translates parallel to the pivot axis as the handle moves from the operating position to the storage position.

5. The surface cleaning device of claim **4**, wherein the handle is substantially parallel with the longitudinal axis when the handle is in the operating position and the storage position.

6. The surface cleaning device of claim **4**, wherein the pivot axis is non-perpendicular to the longitudinal axis.

7. The surface cleaning device of claim **1**, further comprising a locking mechanism to selectively lock the handle in the operating position.

8. A surface cleaning device comprising:

a base including a suction nozzle;

a cleaner housing pivotally coupled to the base, the cleaner housing defining a longitudinal axis;

a handle moveably coupled to the cleaner housing such that the handle is movable relative to the cleaner housing from an operating position downwardly to a storage position,

wherein the handle is substantially centered on the longitudinal axis when the handle is in the operating position, and

wherein the handle is offset from the longitudinal axis when the handle is in the storage position.

9. The surface cleaning device of claim **8**, wherein the handle pivots relative to the cleaner housing about a pivot axis.

10. The surface cleaning device of claim **9**, wherein the pivot axis is non-perpendicular to the longitudinal axis.

11. The surface cleaning device of claim **9**, wherein the handle linearly translates parallel to the pivot axis as the handle moves from the operating position to the storage position.

12. The surface cleaning device of claim **11**, wherein the handle is substantially parallel with the longitudinal axis when the handle is in the storage position.

13. The surface cleaning device of claim **11**, wherein the pivot axis is non-perpendicular to the longitudinal axis.

14. The surface cleaning device of claim **8**, further comprising a locking mechanism to selectively lock the handle in the operating position.

15. A surface cleaning device comprising:

a base including a suction nozzle, the base defines a front edge positioned adjacent the suction nozzle, a back edge opposite the front edge, a first side surface extending between the front edge and the back edge;

a cleaner housing pivotally coupled to the base, the cleaner housing defining longitudinal axis; and

a handle movably coupled to the cleaner housing such that the handle is movable relative to the cleaner housing from an operating position to a storage position,

wherein when the handle is in the storage position, the handle extends downwardly toward the first side surface of the base and away from the longitudinal axis.

16. The surface cleaning device of claim **15**, wherein the handle pivots relative to the cleaner housing about a pivot axis.

17. The surface cleaning device of claim **16**, wherein the pivot axis is non-perpendicular to the longitudinal axis.

18. The surface cleaning device of claim **16**, wherein the handle linearly translates parallel to the pivot axis as the handle moves from the operating position to the storage position.

19. The surface cleaning device of claim **18**, wherein the handle is substantially parallel with the longitudinal axis when the handle is in the storage position.

20. The surface cleaning device of claim **18**, wherein the pivot axis is non-perpendicular to the longitudinal axis.

* * * * *